"All the islets of the atoll are covered with a vegetation that thrives on this forbidding-looking soil. The beaches are narrow, and there are no natural clearings. The growth is low in only a few places, next to the beaches and in patches of the big taro swamp. Elsewhere trees give nearly unbroken shade.

Heavy rainfall and rapid drainage have two effects on the vegetation. An unfavorable one is to leach out the soluble part, which is to say much of the plant food, in any decaying vegetable matter that accumulates on the ground. While this may prevent the growth of some plants, it is more than offset by another effect of rainfall and drainage, the leaching out of excess salts. Dr. F. Raymond Fosberg, who participated as a botanist in the U.S. Commercial Company's economic survey of this area, kindly prepared the following explanation of how this works:

'The vegetation may be summarized by saying that it is heavier and more luxuriant in direct relation to the amount of rainfall and the area of the island. This is because, as is well known, salinity produces a condition of physiological drought. Saline areas are characterized by a sparse vegetation similar to that of deserts. Where the rainfall is sufficient and the area is large enough to maintain a permanent lens of fresh or almost fresh water the vegetation of the interior portions is more or less mesophytic and luxuriant.'

This effect is heightened by the muck of such places as the taro swamp that takes up the interior of Falālap. To quote Dr. Fosberg again: 'It is probable that this muck,

besides providing a more fertile substratum, retards the diffusion outward of the available fresh water, also retarding the diffusion inward of salt water that always accompanies dry periods.'

The number of plant species listed was 64, of which 26 were trees, three classified as shrubs, and the remaining 35, herbs. After spending several days in helping me collect the native names of plants, Tom assured me that I had all that grow on Ifalik. Of course, the statement was not accurate. In fact, several kinds [14] were added later, and no doubt some were missed. Still, the list probably gives a fair idea of native knowledge of the flora."

(1947-48)

English or Hawaiian Name	Native Name	Scientific Name
coconut	lu, nu	Cocos nucifera
breadfruit	mai	Artocarpus altilis
banana	uir	Musa
pandanus	far	Pandanus
papaia	baiwai	Carica papaya
hau	gilivō	Hibiscus tiliaceus
kamani (tamanu)	ragūes, sevang, vitou	Calophyllum inophyllun Linn.
	wutu	Guettarda speciosa
	treli	Messerschmidia argentea(Linn.

gul	Barringtonia assiatica
lel	Morinda citrifolia
avus	Crataeva speciosa
waryng	Ocimum sanctum
aro	Premna integrifolia Linn.
aroma	Pipturus argenteus (Forst. f.) (Wedd.
kelau, gula	Cordia subcordata Lam.
Gaingei	Pemphis acidula
tria	Rhizophora mucronata Lam.
song	Bruguiera conjugata (Linn.) (Merr.

	remag, natu	Scaevola frutescens
	kasās	Terminalia catappa ? [15]
English or Hawaiian Name	Native Name	Scientific Name
plumeria, frangipani	seuru	Plumeria rubra
banyan	giliao	Ficus sp.
staghorn fern	kamarag	Gleichenia sp.
spider lily	giop	Crinum sp., probably asiaticum
bird's nest fern	enenux	Asplenium nidus
(a fern)	riri	Polypodium phymstodes Linn.
purslane	gop	Portulaca samoensis

(a grass)	buyol	Lepturus repens (Forst.) (R. Brown)
turmeric	angorik, gerēl, geval	Curcuma longa Linn.
(a sedge)	bwogorewau	Cyperus brevifolius (Rottb.)
sugar cane	wou	Saccharum officinarum
taro	wot	Colocasia esculentia
pulaka	pulax	Cyrtosperma chamissonis
giant arum	filē	Alocasia macrorrhiza
Polynesian arrowroot	mogmog	Tacca leontope taloides
betel pepper	gabwī	Piper betle
betel palm	bu	Areca catechu

hibiscus	fleros	Hibiscus rosa-sinensis
bamboo	sur, bwa	Bambuseae
pineapple	faretrā	Ananas sativa
squash (a summer squash or vegetable marrow)	kalebwās	Cucurbita pepo
moss (all kinds?)	lum	Musci
mushroom (all kinds)	talingilipat	Fungi"

1: Burrows--16 (1947-48) Woleaians
116, 137 Ifalik

"Specimens of some of the plants of less importance to the people were not collected, because of limited room in a plant press improvised out of empty cartons. Having been advised that artificial heat would be necessary to collect plants in this region, I gave up in advance any attempt to preserve specimens. Later, when the trade winds set in, collection seemed worth risking; but the amount was limited to the number of used cartons. Not until we returned to Honolulu did I learn that satisfactory collecting would have been feasible by painting the specimens with formaldehyde.

Native names of plants unidentified for lack of specimens follow:

Trees: livalus (possibly Vigna marina), kirali, marat, mot, sol, rangonax, faliap, kili, kuelabo.

Herbs: korax, ualomax, atogobwei, guruguru, kerriō, guan, bogo li le pa, atilt, keisi, kevakuel, nge.

The most useful plants occur in a number of varieties. Names of some of these indicate the island from which they are traditionally supposed to have come. Botanical comparison might check the accuracy of these traditions; at any rate, they give some indication of the range of contact with other islands."

1: Burrows--16 (1947-48) Woleaians
116, 137 Ifalik

"Coconut (lu or nu--the vowel sound variable, often liu or similar). Four varieties are distinguished. All are said to occur throughout the Carolines. The people say they can tell at once, by looking at a tree or ripening nut, to which variety it belongs. The difference, as they describe it, is in the shape, and more particularly, the color, of the husk when the fruit is ripening. The names of the varieties are used either like adjectives, following the generic name, or else as nouns, as when we call an apple a Baldwin.

The varieties are: garau(e)rau, husk brown when quite young; mau, husk green and round; tra, husk reddish; ial, yellowish. Of this last variety there are only a few trees on Ifalik. No distinction is made among the varieties in quality or suitability for particular uses."

1: Burrows--16-17 (1947-48) Woleaians
116, 137 Ifalik

"Breadfruit (mai): There are two main kinds, easily distinguishable by either the leaf or the fruit.

Mai vae--leaves very little indented; the young leaves not at all. Fruit comparatively small, with a number of large seeds (pukil).

Mai vau--leaves deeply indented. Fruit larger, with a fibrous core and no seeds. Seven sub-varieties of mai vau are distinguished: tagumelin, mai rau, mai mwarei, seuaiki, welige sol, mauli, tro malo.

Mai guiau--leaves deeply indented, like mai vau; fruit with seeds, like mai vae. Apparently this variety is comparatively unimportant.

No preference of one variety over another is expressed, so far as quality of fruit is concerned. The larger size of the fruit of mai vau and the absence of seeds are recognized as advantages. The seeds of mai vae can be eaten, but are often thrown away. Mai vae seems to bear earlier than mai vau, at least during the secondary crop, that which comes in early in the trade-wind season. The main practical difference [17] among the varieties seems to be that only two of the sub-varieties of mai vau, tagumelin and mai rau, are thought to have wood suitable for outrigger floats. It is said to be more buoyant than that of other varieties."

1: Burrows--17 (1947-48) Woleaians
116, 137 Ifalik

" 'Taro' (Pulax; Crytosperma chamissonis). Twelve varieties were pointed out: patsa, pulax e mau, pereliau, talinga mor (Mor's ear?), talinga nap (big ear), sia li ralo, pulax i sali, annIpenni, pulax e bwar, filal, pwololo, etI Ii bwulax, gor. There are considerable differences in color, texture, and flavor of the underground part, and some are considered choicer than others. The varieties are indistinguishable at sight to me, and so they are, Tom assured me, to him. Taro is in the woman's sphere, and only women are experts in it. The only distinguishing characteristic pointed out by his wife, Lagajarong, applied to the variety called etI li bwulax. If I understood her rightly, she said that if you plant the pistil (?) from the flower of this variety, it will grow.

True taro; wot; Colocasia esculenta. An impromptu committee of three women gave me the following list of 18 varieties, and assured me it is complete: elibwā, gaimwem, waligo, likerak, tarewai, sarewāk, mivou, tolipanneu, ganipwā, garimar, geratIgi, pei, rangoi, togōs, otumalu, outeriap (from Yap). The tubers vary in texture, flavor, and public esteem."

1: Burrows--17 (1947-48) Woleaians
116, 137 Ifalik

"Banana (Wir; Musa sapientum). Six varieties are recognized. No erect fruit clusters were seen. The fruit of all the varieties brought to us (I think this includes all there are except possibly the two Yap varieties) is sweet and can be eaten raw, though we preferred one or two of them cooked.

bwongër--this is considered the original variety, 'native' to the island. The fruit is large, the skin of an orange color, the flesh somewhat rosy. Fruit prized for eating, fiber for weaving, dried leaves for cigarette wrappers.

wlrls Truk--supposedly from Truk. Fruit of medium size, pointed, yellow--our favorite. Fiber considered good for weaving, leaves for cigarette wrappers.

reiap--supposedly from Yap. This variety is used for all three purposes, but it is considered inferior.

melawalibwe--another variety ascribed to Yap. Fruit small and little eaten. Leaves not used for cigarette wrappers. This variety is chiefly valued for fiber from the trunk.

wlrls Seipan--as the name indicates, supposedly introduced from Saipan. The bright yellow fruit is considered good (we preferred it cooked). Valued also for weaving fiber and cigarette wrappers.

wlri li Valupe--supposedly from Ponape. Short fruit in big bunches. Valued for all three uses. There are only a few plants of this variety on Ifalik."

1: Burrows--17-18 (1947-48) . Woleaians
116, 137 Ifalik

"Pandanus--Three varieties are recognized.

far--considered the old native variety. Grows on relatively high, dry land. The favorite for mats. [18]

far en Nuta--supposedly introduced from 'Nuta', said to be in the Marianas--presumably what our charts call Rota. Cured leaves prized for sails.

pogū--grows in swampy places. Glossy leaves of enormous size. Valued only to wrap around coconut trunks to prevent rats from climbing."

1: Burrows--26
116, 313, 137

(1947-48)

Woleaians
Ifalik

"The supply of wood, whether for fuel or timber, is scanty. Breadfruit makes a good soft wood; but since the trees are needed to grow food, there is little of it to spare. Many species furnish hard wood; but on Ifalik none of them grow into large trees."

" Native Timber Trees

Names of other trees used for timber, with more specific notes on the uses, follow:

aro-Straight shoots used for palings on house walls, or slats on canoe platforms; saplings used for canoe poles; large trunks for house posts.

gaingei-Proverbially strong. Used for some of the small pieces of canoe outrigger attachment. A favorite for levers, poles, walking sticks.

kelau, kalua-First choice for house posts. Said to be very durable in the ground.

kili-A small tree. The tough wood is used for canoe paddles and smaller house timbers.

lel-House timber.

mog-House timber.

ragēs-(Also called sevāng and vitou) canoe end-posts and outrigger booms.

sol-House timber.

treli-a hard wood with various uses; its forks favored for the forked sticks attaching outrigger floats to booms.

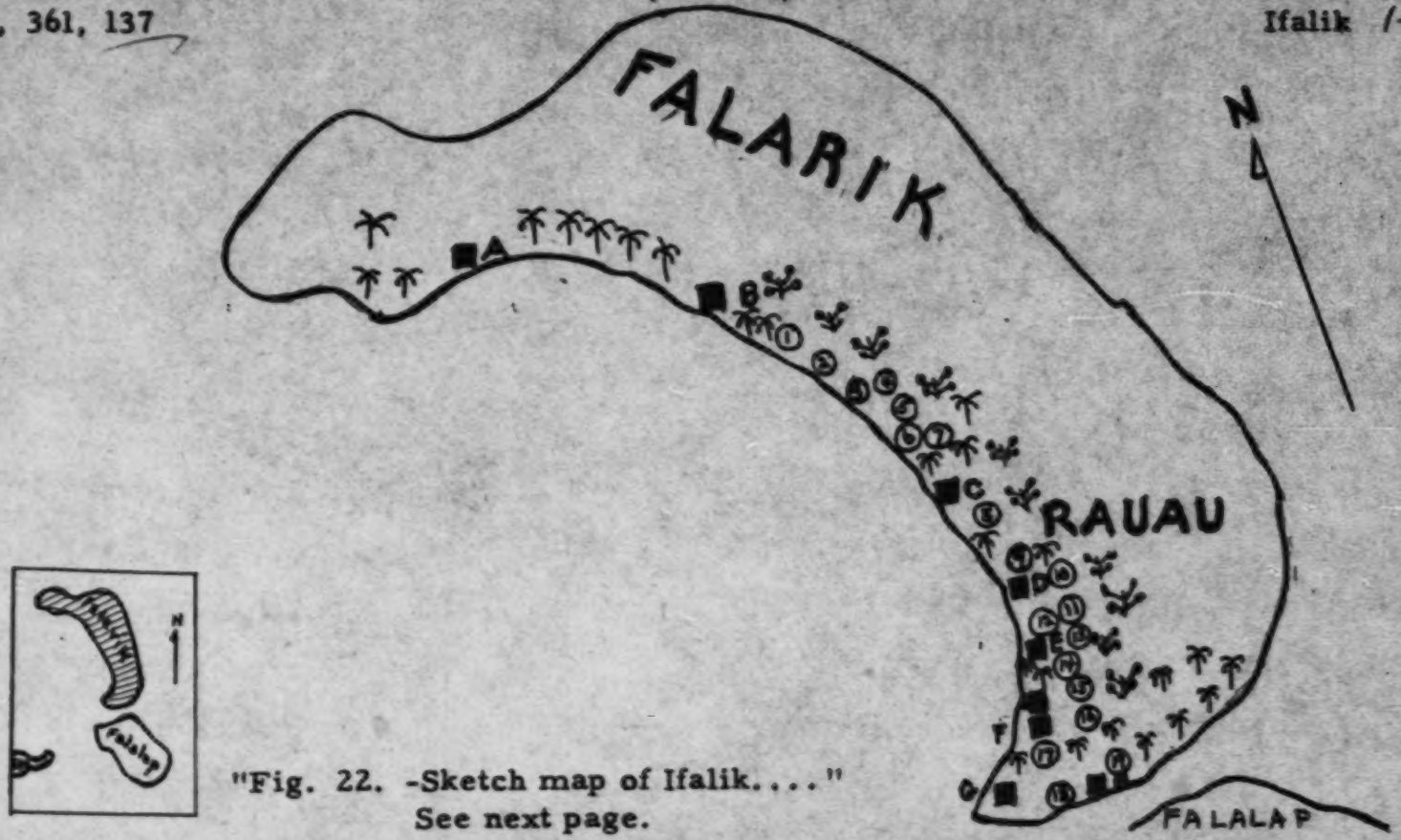
wutu-House timber.

tria-Hard, straight-grained wood used to make men's combs."

1: Burrows--92-A
116, 361, 137

(1947-48)

Woleaians
Ifalik 1-3



"Fig. 22. -Sketch map of Ifalik...."
See next page.

"Fig. 22. -Sketch map of Ifalik, showing buildings and types of vegetation."

See next page.

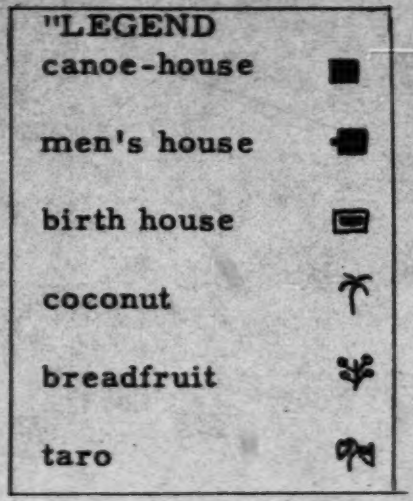


Fig. 22. -Sketch map of Ifalik, showing buildings and types of vegetation.
Numbers designate homesteads, from north to south. Their native names follow:
1, FalolorIk; 2, Atrovalū; 3, Atiuwan; 4, Atielū; 5, Nuteitei; 6, Nimau; 7, Bwėnnau; 8, Falegumei; 9, Aulivang; 10, Faleoulėrix; 11, Uluas; 12, Fanneserax; 13, Xalingelū; 14, Foraix; 15, Welipeien; 16, Somat; 17, Falevelū; 18, Uelepi; 19, Uarigin; 20, Metalegop; 21, Apilimat; 22, Falūn; 23, Weluāra; 24, Gauong; 25, Auriela; 26, Leagago; 27, Fal i Trel; 28, Arotrang; 29, Ilux.
Canoe-houses, from north to south: A, Pa'ugop; B, Gajuteling; C, Fan ni Wā; D, Sabwōlap; E, Fale Pëngā; F, Katēlū; G, Fan ni Wong; H, Paurël; I, Gavilea."

2: Damm et al. --8 (1909) 1938 Woleaians
116, 137 Ifaluk

The scenic charm of the group is greatly enhanced by the profusion of coconut palms and bread-fruit trees. According to the [AN: British] Pacific Islands Pilot, 1933, these were only found in numbers on Felādjik and Falālap; Elā, on the other hand, only had a few of them.

2: Damm et al. --115 (1909) 1938 Woleaians
116, 137 Aurupik

Sievers emphasizes the fine growth of coconut palms; among the cultivated plants you see principally field and swamp taro, and sweet potatoes.

2: Damm et al. --156-157 (1909) 1938 Woleaians
116, 137 Faraulep

Hellwig has already given an enthusiastic description of the picturesque impression which the thickly wooded Faraulip makes on the traveler; and in truth [157] there are many species of flora. Sievers counts coconut palms, bread-fruit trees, bananas, Cystosperma edule, betel palms and pandanus trees. [CS: Omission of the names of the plants.]

3: Thilenius and Hellwig--260 (1909-10) 1927 Woleaians
116, 131, 137, 484 Elato

Elato is the largest of the four islands which rest upon the reef that extends itself in a north-southern direction. Elato, situated to the north, is densely covered with forests; breadfruit trees and coconut palms predominate.... The natives [AN: who had come in canoes with trading intentions] did not look very trustworthy. They were importunate and begged constantly for tobacco... Trading attempts were made, but the prices were too high and consequently only a few objects could be bought.... On certain stretches the breadfruit trees reminded us of a German forest. On other places attention was drawn to thickets of Hibiscus which supply the textile fibers for mats and waistcloths.

4: Krämer--186 (1909) 1937 Woleaians
116, 137, 487 Woleai

Fialap is well covered with trees; paths cross the island in various directions.

4: Krämer--291 (1909) 1937 Woleaians
116, 136, 137 Woleai

[ER: Indices of the fauna and flora of Oleai follow on pp. 295-298 of source, but are omitted here; they include lists of the mammals, birds, fish, shells.]

5: Kittlitz--124
116, 161, 137

(1827-8) 1858

Woleaians
West Fayu

We hunted in vain for the Mannaľjö sandbank, which Don Luis de Torres had mentioned, and then we steered west again, and on the 22nd of February we sighted the little islands Pyghellá and Fajïhú. Neither one is inhabited; on Pyghellá we saw some coconut palms rising above the succulent bushes, on Fajïhú there were tall trees, but no palms.

5: Kittlitz--153-55 (1827-8) 1858 Woleaians-1-2
116, 131, 137, 136 Woleai

Toward noon, we tacked to the anchorage inside the lagoon [MR: on the southern side]; this spot was remarkably like the one at Lugunor. In both places the strip of land, which lay just a short distance from us, was the eastern part of the island group, but here it was composed of three separate islands, which were separated by very narrow canals, while the other was formed by the long island Lugunor, the principal one of the group. The southern one of these islands is Ra-ur, the central one Palliau, and the northern one Ulea or Uleai; it is also the entrance to the north side of the whole group. Uleai, which is the largest island of the group, is shaped like a triangle with flattened sides. Farther north on the edge of the shallows is Marion Island, which is to Uleai what Funoar is to Lugunor, except that the partially submerged reef between it and the main island is not so long as the one between the other two islands. All of these places that I have mentioned are like the Lugunor group in that they are partially covered with very tall trees, in whose shade the houses are [154] scattered, with little lawns around them. At low tide it is very easy to wade through the canals between the islands of this eastern shore, especially the one between Ra-ur and Palliau. We noticed that the large forest trees included more varieties than on Lugunor; there are fine specimens of Callophyllum ...and the Hernandia ovigera.... We saw the sea-swallow (Gygis candida) around the crowns of these trees.... Among the beach birds we saw the Strepsilas collaris...and the Numenius tenuirostris... In the bushes I found the Sylvia Sryinx and the black variety

of Lamprothornis....

On this island group there are neither hens nor doves, and we also missed the Ptero-pus. On the other hand I once saw [155]...the cuckoo...

The vegetation of these islands is naturally very similar to that of the Mortloks Islands... The Tacca pinnatifida, whose root should produce a fine arrowroot...is much more common than on Lugunor....

6: Sénfft--53 (no date) 1905 Woleaians
116, 134, 136, 137 Woleai

The soil seems to be altogether coralline. There are no mountainous regions, and the vegetation is abundant. In spite of the thin layer of humus, the usual plant products of atolls are found here, chiefly coconut palms, which are strong and healthy, large breadfruit trees, pandanus, bananas, Calophyllum, marshmallow, arrowroot, some sugar cane, taro, Cystosperma edulis, and curcuma. There are few mangroves, and no bamboo or areca.

The fauna consists of pigs, chickens, dogs, cats, rats, and sea and land birds; there are few beetles and butterflies.

6: Senfft--53 (no date) 1905 Woleaians
116, 136, 137 Lamotrek

The vegetation is the same as on Oleai. In the central section of Lamutrik Island there is an extensive swampland in which there are copious taro and sugar cane plantations. The fauna is also the same, but there are far more sea birds and rats on this atoll, while there are no cats at all. The rats do a great deal of harm to the coconuts. The natives wrap pandanus leaves around the trunks to protect the palms from the rats; the sharp thorns of these leaves prevent the rats from running up the tree.

7: Senfft--193 (No date) 1904 Woleaians
116, 131, 137 Faraulep

I met several canoes which had been on their way out but returned to show me the passage into the reef of Faraulip Island. The three islands of this atoll are low islands. The coralline soil is overgrown with healthy specimens of coconut palms, breadfruit trees, bananas, Cystoeperma edule, some tobacco, and some pandanus and betel trees.

9: Senfft--13 (1903) 1904 Woleaians
116, 137 Lamotrek

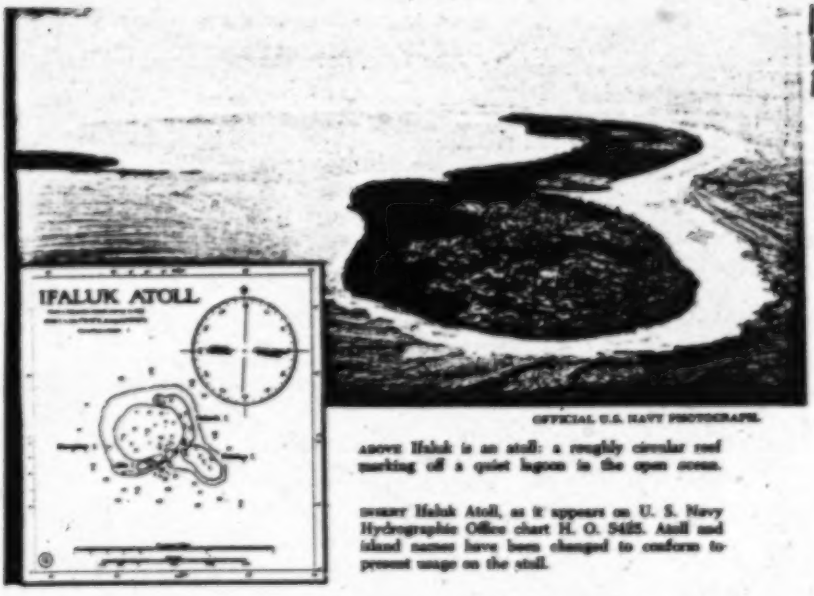
Lamutrik is a typical atoll in the form of an isosceles triangle with the islands Falaite, Puch, and Lamutrik, of which only the latter is inhabited, situated on its three points. It offers a pleasant view with its white sandy shore and a small bay where the German flag can be seen in the background. Coconut palms, breadfruits, pandanus, hibiscus, some curcuma and arrowroot, some Calophyllum, Crataeva speciosa, and Averrhoa carambola trees and taro thriving on marshland, sugar cane and Cyrstosperma edule can be seen growing densely on the island; yams and bamboo are entirely lacking. Fowl and pigs are not very numerous, and the amount of fish in the lagoon has decreased; on the other hand there are many land- and seabirds living in the trees. The cultivation on the other two islands of the atoll is supposed to be the same. Accordingly a plantation of coconut palms on these islands is not possible or at any rate only to a very small extent.

28: Spiro--7 [3] (1947-48) 1949 Woleaians
116, 137 Ifalik

"Vegetation is dense in the bush, the luxuriant flora compensating for the paucity of fauna."

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

131
133
100.



OFFICIAL U.S. NAVY PHOTOGRAPH.

ABOVE Ifaluk is an atoll: a roughly circular reef marking off a quiet lagoon in the open ocean.

INSET Ifaluk Atoll, as it appears on U. S. Navy Hydrographic Office chart H. O. 5425. Atoll and island names have been changed to conform to present usage on the atoll.

BELOW The chiefs turned the Fan Nap, the Men's House, over to us for our residence.

345
139
114

[P.32(A)]

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

126 Don and I spent one morning drawing a base map for the island of Falarik from a mosaic of the vertical air photographs. With this outline, the next problem was to fill in details of trails, households and vegetation. We thought we would start by mapping the principal trails.

Both of us were rank amateurs at sketch mapping. We had a Brompton compass lent by Ted Arnow and a triangular ruler marked with conventional scales, but no measuring tape more than six feet long and no plane table.

We first tried improvising a tape by tying knots at two-yard intervals in 100 yards of cod-line. When we had finished this tedious job, we discovered the darn thing stretched and tangled too easily to be of any use. I then dedicated myself to trying to learn to pace accurately, and soon managed a pace that fitted nicely when used on the base map with the 1:2500 scale of the triangular rule. This "Bates pace" was a purely arbitrary unit, but it worked well enough for our purpose. I learned to make nice adjustments in scrambling over coral boulders and around breadfruit trees and through fern thickets so that I could come out with the proper count. In crossing the island, plotting the course on the outline map made from the air photos, we generally found an error of five or ten feet (it was about 900 feet across Falarik). This would probably have been disgraceful for an engineer but it pleased us immensely.

First we tried noting compass directions and number of paces for the quirks in the paths with the idea of plotting these on the map later. But this didn't work—too many mistakes. So I tried making a plane table by sinking a German camera adapter-screw into a board so that it could be fastened to an American camera tripod. The resulting contraption could not be called sturdy, but I was very proud of the improvisation.

We quickly worked out an effective system for dealing with trails. The mapping team consisted of Don, Bakal, Tony and me. Don handled the plane table, equipped with the triangular rule, the compass and a towel for switching away flies. Bakal toted things. Tony scouted ahead on the winding trails. I would keep an eye on Tony and when he seemed about to disappear on a trail, would call out to him to wait

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

and then pace directly toward him. Don would sight on Tony (or me on arrival) to get the direction, and I would call back the paces so that Don could draw directly on the base map.

The main trail of Falarik, which I got in the habit of calling "the broad highway," or sometimes "el camino real," ran through the coconut grove parallel to the lagoon shore, generally twenty or thirty yards in from the water. It was about two yards wide, and neatly marked on each side by a row of moss-covered coral rocks. This broad highway ran between the Fan Nap and the lagoon, and passed directly in front of five of the big canoe houses that faced the lagoon along the Falarik shore. The sixth canoe house on Falarik was away from the trail on the point of land that jutted toward Falalap. There were also two canoe houses on Falalap, one facing the lagoon, and the other facing the pass between the two islands.

The canoe houses, clearly distinguishable on the aerial photographs, were convenient reference points in mapping. They served not only for the storage of canoes, nets, lines and other gear, but also as social centers for the men of the atoll. Groups gathered there to talk, or rest, or weave nets, or carry on the never-ending job of making twine or rope from sennit, coconut fiber. A big sea-going canoe was being built in the Falepenach canoe house, near the Fan Nap, during the summer of 1953. This provided me with a convenient and continuing subject for photography.

The broad highway ran for almost a mile along the lagoon shore of Falarik, extending considerably beyond the last habitation, toward the north end of the island, ending abruptly in the middle of nowhere. This northern tip of the island, beyond the end of the trail, was a wild tangle of vegetation, relatively little visited and little used. Except for this northwest tip, the whole of the lagoon margin of the island was a park-like coconut grove, kept clear of weeds or shrubs with almost no other kind of tree—only an occasional breadfruit tree near the household areas, and a few other things like the big *Barringtonia* by the Sabolap canoe house.

The entire course of the broad highway was thus through the open coconut grove. The habitations were mostly set at some distance back from the highway, near the "boondock line."

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

We picked up that word "boondock" in Guam, and very useful it proved to be. It became an important part of the Abbott-Bates vocabulary, and may well have also infected the Ifalukian speech. In Guam, it was used to refer to the wild tangle of miscellaneous vegetation that had taken over so much of the island after the disruption of the war.

The boondocks on Ifaluk were the parts of the atoll that were not clearly something else—that is, not coconut grove, not taro swamp, not household area. The boondocks were not exactly wild, because all sorts of useful things grew there, including planted coconuts and breadfruit trees. They were not exactly cultivated either. Such areas could thus hardly be called "jungle" or "scrub"; and "forest" seemed rather inappropriate. "Boondock" was just the word; though we could perhaps better have used the Ifalukian equivalent, niwel.

The boundary between the coconut grove and the boondocks was sharply defined: weeds and shrubs were kept cleared out of the coconuts only up to this definite line—the boondock line. This again roughly paralleled the lagoon shore, fifty or sixty yards in. We plotted it on our map, later, when the trail mapping seemed fairly well in hand.

The habitations, deep in the coconut grove and near the boondock line, were grouped into "households." The census showed that there were twenty-six such households on the atoll, eleven on the island of Falalap, and fifteen on Falarik. The Falarik households were not scattered evenly along the highway and lagoon, but formed two clusters or villages, one called Ranau, at the south end of the island—the Fan Nap was in the middle of this—and the other called "Falarik" (the address would probably be "Falarik, Falarik") with a gap of about a quarter of a mile along the broad highway between the two.

The whole system of land ownership of the island was built around these households, each of which had a name. Later in the summer we tried to map the holdings of one household, Falepenach. These holdings included not only the immediate vicinity of the living quarters, but also several patches of boondock and coconut grove on Falarik, and patches in the big taro swamp on Falalap. The patch arrangement seemed to provide that each household would "own" its share of each of the different kinds of land.

The households varied greatly in size, from one which included

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

side of the trail there was an open grove of high breadfruit trees and other plantings of the Falivelu household.

This trail by Katelu we called the "schoolhouse trail"—because it led directly to the schoolhouse. The schoolhouse was a thatched shed built in a large clearing exactly half way across the island. It had been put up in accordance with instructions, either from the Navy or the Trust Territory, and contained a blackboard and a supply of essential equipment like boxing gloves and basket balls. But how would one go about introducing schooling on Ifaluk? Or should one? The answer to this latter, surely, is "yes" because willy-nilly the Ifalukians must learn to deal with the outer world in these days when that world has become a small neighborhood, and even Ifaluk cannot be protected by its remoteness. But the question of how to introduce this schooling is a complex one for which perhaps no one has a clear answer.

At any rate, the schoolhouse was not used for educational purposes during the period of our stay, but it did have uses. The clearing was a handy place to locate the rain gauge, and the schoolhouse itself, with its open sides, seemed a good place for the regular measurements of shade temperature and humidity. So the area became our meteorological station.

On this south end of Falarik the coconut grove of the lagoon shore extended right around the tip of the island to the ocean side, enveloping the schoolhouse yard. The trail was straight and formal, however, only as far as the school; beyond it became a winding footpath leading through the coconuts to the ocean beach.

Except for this southern end and the long stretch of lagoon shore, Falarik was covered with boondocks. Coconuts grew all through these boondocks, and the principal forest tree was breadfruit. But there were a dozen other kinds of trees, and a thick underbrush of bushes and ferns—ferns everywhere. There were many swampy areas in the center of the island, but the land became slightly higher toward the ocean shore, the surface rough with coral boulders, culminating in a definite "boulder ridge" paralleling the ocean beach.

The beach on the ocean side was narrow, sloping rather steeply from this boulder ridge. Along most of the length of the island the beach, too, was covered with coral rocks, but there were also stretches of coral

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

133 sand. Out from the beach there was a hundred yards or so of coral platform, largely exposed at low tide, then finally the edge of the reef itself against which the great rollers of the Pacific broke their force all the year around.

133 361 The other inhabited island, Falalap, was rather different: a large, rounded blob sticking out into the sea and spoiling the neat circle of the atoll. The habitations were all on the northwest end of the island, across the narrow pass from Falarik. Here, too, there was a maintained park-like area, corresponding to the lagoon-side coconut grove of Falarik: but on Falalap, coconuts and large breadfruit trees were interspersed, giving a different "feel" to the landscape.

133 137 262 The center of Falalap was largely a great swampy area carefully cultivated by the women of both islands. Two kinds of aroids (taro), *Colocasia* and *Cyrtosperma*, were grown there for their edible, starchy roots which, with breadfruit, formed the staple food of the atoll. We did not get around to exploring this region in any detail until late in the summer.

123 226 The mapping operation was kept up fairly steadily for several days, but there were always intermissions. On Friday afternoon—the second day of the mapping—Bakal and Yani had no difficulty in persuading us to knock off mapping and go spear fishing. We all piled into Bronson's skiff and rowed over to the shore of Ella, outside the pass into the lagoon. Don was rather snooty about this skiff, remarking that a Western rowboat looked like a garbage scow beside the trim and speedy Ifalukian canoes. But Yani and Bakal liked it—perhaps partly because it was foreign, but also because it was steady and because it [136] could hold several people easily. Don, maintaining his scorn, called it the BWUP after one of the more ungainly species of trigger-fish.

227 Yani and Bakal each had steel-pointed wooden spears, about fifteen feet long; and short, slender steel spears. The long spears were for poking; the short spears were shot from a sling. The sling looked like a strip of inner-tube; at one end was a string loop, tied on firmly; at the other end the rubber was tied into a loop just large enough to slip over the thumb. With the rubber loop over the right thumb, the string loop was pressed over a slight notch in the butt of the spear, and the spear then simply pulled back with the left hand and let go. It worked like a Hawaiian sling spear, with the hand replacing the hollow bamboo grip.

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

●137

ABOVE The boondocks were not exactly wild; they were not exactly cultivated either.

BELOW We tried to collect botanical specimens of all of the kinds of plants on the atoll.

126
302
516
192

[P. 64(D)]

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

At any rate, Ted thought it was time for a present when Bakal turned up at the Fan Nap ready for dancing after the day of fishing, with a garland of flowers in his hair, big lilies in the holes in his ear lobes, and a fresh green coconut skirt over his red loin-cloth. Ted had noticed the Ifalukian passion for ornament when he was there before, and this time came prepared with appropriate gifts, especially a good supply of ropes of the tinsel used for decorating Christmas trees. He got out a length of this tinsel for Bakal, who was delighted. Bakal ran his big, wooden comb through his hair several times to make it stand out stiffly (it stuck up in a great puff about three inches high anyway) and wound the tinsel around it in a double strand from the top of his head, at a rakish angle that brought it low over the right ear. A very flashy get-up for a young blade.

After two weeks on the island, we had become somewhat relaxed in this matter of male ornamentation. The people from the first would offer us maramars—garlands of flowers—for our hair, and we would accept them politely and appreciatively—and wear them sheepishly. But the sheepishness wore off rapidly. Presently I found myself expressing admiration for the effect of a wreath of velvety yellow four-o'-clocks on Don, and Don would notice the nice touch of bright red hibiscus on my black hair. Ted's beard was approaching magnificence, even at this early stage and made a fine accompaniment for flower garlands. After a while we reached the point of nailing up a mirror in the Fan Nap, so that we could arrange our garlands tastefully and appropriately before sallying forth in the morning. This process came to be known as "bakalizing" after one of its most devoted practitioners.

It was interesting to watch the process of disintegration of Western male prejudices in ourselves. The necklace given me by Tachi was one step in this process. Tachi, a boy perhaps twelve years old who lived near us, cut his foot very badly one day on a coconut shell. He came to me for help and I dressed the foot regularly every morning until the wounds had healed. Tachi, in gratitude for this doctoring, brought me a beautiful cowrie-shell necklace.

I put on the necklace doubtfully, expecting jeers from Ted and Don. But instead they both, with obvious envy, said how nice it looked! I wore it for a day and generously offered to lend it to Ted and then to Don. The loan was accepted, and for a long time I could only wear

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

146 114 come to view with suspicion these tables giving comparative nutritional values for different parts of the world. Truly, much of the world suffers from malnutrition as compared with the United States or Western Europe; but also, I think, our nutritionists have failed to give adequate attention to possibly varying needs. The food needs of man in Ifaluk and of man in New York are not necessarily the same.

121 262 One problem with diet studies is the difficulty of keeping track of snacks, of occasional foods; yet such occasional or incidental food may be very important in relation to some vitamin or mineral requirement. We were very conscious of this problem, and Ted and Don made every effort to keep track of incidental food as well as of staples. Yani was particularly helpful in this, because he tried to remember and report all of the incidental things that he and his friends ate as they wandered about during the day. On this basis, there was considerable variety in the Ifalukian food. At least thirty kinds of plants were eaten in one way or another (not counting "medicines"). Don got records 262 136 of eighty-eight different kinds of fish that were eaten, and guesses that there must be many more. For animals, there were also sea turtles, chickens and other birds, and occasionally pigs and dogs. Some seventeen kinds of molluscs were eaten, eight kinds of crustaceans, and a few other things like sea anemones and one kind of sea urchin.

● 137 We arrived at the height of the breadfruit season. Breadfruit trees grew everywhere, producing far more fruit than could be used; and the fallen, rotting fruits were probably the chief breeding places of [136] the flies that so plagued us. As the breadfruit harvest dropped later in the summer, so did the numbers of flies.

137 262 Breadfruit in its season (June through September, with a second, smaller crop in February and March) is the staple food, the chief source of starch, for the people of Ifaluk. It is a staple on most of the islands of the tropical Pacific—the "bread" of Polynesia and Micronesia.

137 245 The big, starchy fruits grow on a handsome tree, probably native to Malaya. It may well be among the most anciently cultivated of plants and the main food varieties are seedless, completely dependent on man for reproduction. It is propagated from shoots which spring up around the base of the trunk, and the colonizers of the Pacific—

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

Polynesian and Micronesian—had to carry the precious young plants with them on their long canoe voyages to new islands.

The famous expedition of Captain Bligh with the BOUNTY had the purpose of bringing young breadfruit trees from Tahiti for establishment in the West Indies, where the planters thought it would be an ideal food for their African slaves. This first attempt at importing the tree was frustrated by the mutiny, but plants were successfully brought in on a subsequent voyage. Breadfruit, however, never became a staple in the West Indies. People do not adopt new foods easily (not even slaves), and where new staple foods have been adopted—as in the case of the potato in Ireland—it is generally because of overwhelming advantages. Breadfruit seems not to have demonstrated such advantages to any non-Pacific culture.

We went out one morning with Tom and a young man of his household to gather breadfruit. The man who was going to pick the fruit carried a large coil of rope and a long pole which had a short crosspiece firmly tied near one end. We followed him through a complex maze of boondock paths to a large breadfruit tree. He threw the coil of rope over the lowest branch (about twenty feet up) and pulled it out with his pole, so that the rope was hanging double from the branch.

With the aid of the rope he climbed easily up the trunk to this first branch, whence he could scramble to any part of the top of the tree. We watched him walk upright along one horizontal branch about thirty feet above the ground, using his long pole as a sort of balance after the fashion of acrobats. With the pole he was able to break off fruit easily in any part of the tree, allowing the fruit to fall to the ground. The bruising apparently did not matter, though the fruit to be used for food must be gathered before it is completely ripe, while the pulp is still white and mealy.

The fresh fruit is either baked or boiled, with many minor variations in ways of cooking. I didn't think much of it, no matter how cooked. It seemed no better or no worse than potatoes, palatable enough with meat gravy—but the Ifalukians didn't have meat gravy.

Breadfruit is the only food on Ifaluk that can be stored for any

Breadfruit is the only food on Ifaluk that can be stored for any length of time (they sometimes smoke fish, but not to keep it for more than a few months). To preserve the breadfruit, the skin is scraped off and the pulp cut into sections which are put into big, open-meshed rope baskets. These are carried to the lagoon, weighed down with coral blocks, and left to soak overnight. The baskets are then removed from the lagoon, covered with leaves, and left for still another night. The pulp can then be kneaded into a paste, which is wrapped in leaves and buried in the ground. The preserving process is quite comparable with that used for sauerkraut, and the stuff lasts for years. We didn't like the taste of this mar, but apparently it is nutritious enough. Considerable quantities are buried every year, insuring a food supply in case of a disaster like a typhoon.

There are seven or eight named varieties of breadfruit, distinguished by the size and appearance of the fruit, shape of the leaves, and the like. In the case of two of the varieties, the fruits have seeds, and in these the roasted seeds are used for food. They have a chestnut-like flavor and quality.

Almost as important as breadfruit were the two taros. This is perhaps doing violence to the word "taro" since it is using it to cover two similar but quite distinct kinds of aroids with edible tubers, one called by the botanists *Colocasia* and the other *Cyrtosperma*. The taro of Polynesia is *Colocasia*, but on Ifaluk both plants were about equally important. These again are anciently cultivated plants, vegetatively propagated, each with endless named varieties. The *Colocasia* on Ifaluk was called wot and the *Cyrtosperma*, pulach (the "ch" is also rendered as an "x" sort of a sound—we argued endlessly about how to spell Ifalukian words).

Both wot and pulach are aroids, that is, they belong to the botanical family that includes the "elephant-ear" plants, the Calla lilies and the Jack-in-the-Pulpit of North America. A third edible aroid, *Alocasia*, called file by the Ifalukians, was grown on the atoll, but it was considered definitely inferior to the other two and little used as food.

Wot and pulach were grown in low, swampy ground in the interior of the islets. The central part of Falalap was almost all swamp, and the main gardens were located there. These taro swamps occur all through the Pacific and it is difficult to know now to what extent they

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

are "natural" and to what extent man-made, because they have been subject to careful cultivation for many generations. The care of the gardens is exclusively women's work and they become expert gardeners. The plants are set in neat rows in rectangular patches, each patch belonging to a particular household so that each household on the atoll has its share of the large Falalap gardens. Weeds grow luxuriously in the rich, mucky soil, and weeding is the main gardening chore. The weeds, I was interested to see, are always buried in the muck, so the practice of "green manuring" is an ancient one here. With young plants, coconut leaves were sometimes used as mulch, to cut down the growth of weeds.

I was greatly impressed, watching these women go about their work, at how little a Westerner would be able to tell them about gardening practices, at how well their methods were adapted to the plants and environment of their atoll. Perhaps one could put this another way, and wonder at how little modern "civilized" man with all his science has been able to improve on, or change, the gardening practices developed by peasant cultures through generations living close to the earth. We have made drastic changes in large-scale agriculture, but the gardener, throughout the world, shares a curiously large fund of common lore.

But I had intended to write here about food, not about agricultural methods. Wot and pulach were eaten to some extent, even during the breadfruit season, just as the preserved breadfruit (mar) was eaten to some extent at other times of the year, making some variation in the daily monotony of starch. There were many slightly different ways of cooking these tubers. We liked best a way of preparing wot (*Colocasia*) whereby it was mashed, cooked with coconut cream, moulded into little balls in a pot, and the whole covered with a thick paste of coconut meat. The effect was a little like that of mashed sweet potatoes served with heavy whipped cream.

Coconut, of course, permeated every aspect of Ifalukian cooking—the milk from green nuts and ripe nuts, the flesh from green nuts and ripe nuts, the sap from the cut flower stalks (here called hachi, perhaps best called "toddy" in English). The coconut was more often used as a supplement in cooking breadfruit or taro, as a seasoning, or the